

Appl. No. 09/827,141
Amtd. dated April 5, 2004
Reply to Office action of November 5, 2003

REMARKS

In the Office Action, the examiner made the restriction requirement FINAL and examined only claims 12 - 29 provisionally elected by applicant. Claims 1-11 and 30 - 36 have been cancelled by the foregoing amendments. In addition, claims 13, 14, 17, 18, 21 and 29 have been cancelled and claims 12, 22 and 25 have been amended.

The foregoing amendments combine original Figures 1, 2 and 3 into a new Figure 1, cancel original Figure 4 and renumber Figures 5 to 13D as Figures 2 to 10D.

The amendments to the specification are for consistency with the amendments to the claims and drawings.

In the Office Action, the examiner rejected claims 25 and 26 under 35 U.S.C. 112 for lacking antecedent basis for "pair of reflectors". Claim 25 has been made dependent upon claim 23 which provides the required antecedent. Claim 26 has been amended to specify "pair of right angle reflectors". For consistency, the same amendment has been made to claim 27. Also, claim 23 has been amended, for greater clarity, to specify that the right angle reflectors are offset. Support for this amendment can be found in original Figures 5 - 8, 9A, 10A and 12A.

The examiner rejected claims 12, 13, 17, 18, 21, 28 and 29 under 35 U.S.C. 102(e) as anticipated by Braun *et al.*; claims 15, 16 and 19 as unpatentable under 35 U.S.C. 103(a) over Braun *et al.*; claim 14 as unpatentable over Braun *et al.* in view of Moeller *et al.*, and claims 22 - 27 under 35 U.S.C. 103(a) as unpatentable over Braun *et al.* in view of Sandercock.

By the foregoing amendment, the subject matter of original claims 12, 13 and 14 has been added to claim 12 and original claims 13 and 14 have been cancelled.

As amended, claim 12 defines an optical spectrum analyzer including a polarization control module for decomposing the input light beam into two orthogonal components and rotating the polarization state of one relative to the other so that they are parallel to each other and one of the principal axes of the tunable filter, such rotation being effected by a twisted polarization-maintaining fiber. In addition, the claim specifies that the first and second light beams are detected individually

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upon leaving the tunable filter unit, i.e., without first being combined optically.

In contrast, Braun *et al.* (i) use a half-wave-plate to rotate the state of polarization of one of their light beams and (ii) combine the two light beams before passing them to the power meter 38 for detection. In contrast to a half-wave-plate, which limits the bandwidth significantly, a polarization-maintaining fiber is very wideband, so an optical spectrum analyzer embodying the present invention will have a greater operational bandwidth. Moreover, detection of the separate first and second light beams, as claimed in amended claim 1, permits two spatially distinct outputs which simplifies the fabrication process.

Braun *et al.* do not disclose or suggest the novel combination of features of amended claim 1. The examiner stated that the orthogonal outputs of Braun *et al.* can be measured as a single output or separated, by a polarizing beam splitter, and measured separately. In fact, Braun *et al.*'s polarizing beam splitter 16 recombines the orthogonal light beams before passing them via output path 3 to the single optical detector 38. Braun *et al.* do not disclose or suggest detecting the two light beams separately and it is submitted that the suggestion by the examiner that they could be detected separately is made with the benefit of hindsight culled from the present applicant's disclosure, possibly as a result of misunderstanding the function of Braun *et al.*'s polarization beam splitter 16.

It is submitted, therefore, that claim 1, as amended, is patentable over the cited references, whether taken alone or in combination. While Moeller *et al.* might disclose the use of a twisted PM fiber to rotate state of polarization, there is nothing in Moeller *et al.*'s disclosure that would motivate the skilled addressee to modify Braun *et al.*'s OSA to replace the waveplate with a PM fiber and detect the two light beams separately after they have finished passing to and fro through the tunable filter unit.

Each of claims 22 - 27 is dependent directly or indirectly upon amended claim 1 and so is patentable for the same reasons. Claim 27 has also been amended to correct the omission of the hollow roof mirrors. Support for this amendment can be found in original Figure 11D.

Claim 29 has been cancelled and its subject matter included in claim 28.

In the drawings, the principal axis P2 has been omitted from revised Figure 1, which shows

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the principal axis P1 extending north-south in the plane of the paper. In addition, the curved arrows in original Figures 1, 5, 9A, 10A and 13A, which implied rotation of the tunable filter about an incorrect axis, have been omitted from the corresponding Figures 1, 2, 6A, 7A and 10A. The paragraph beginning at page 7, line 13 now explains that the filter is rotated about an axis that is parallel to principal axis P1.

This opportunity has been taken to make some minor corrections to the specification, which are believed to be self-explanatory and so are not listed here.

In view of the foregoing, reconsideration and allowance of the application are respectfully requested.

Respectfully submitted



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